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Our ref: KON-1836

Client's ref: P6263-001-0000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of: N. SASA : Art Unit: 1714
Serial No. : 10/718,408 :
Filed : November 20, 2003 : Examiner: C. E.
Title : ACTINIC RAY CURABLE INK :
AND PRINTED MATTER
UTILIZING THE SAME :
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DECLARATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

S i r:

I, Nobumasa Sasa, hereby declare and say as follows:

1. I presented the Declaration dated November 22, 2005 (November 2002 Declaration) in this application.

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2. I am aware that the Examiner believes that I did not test the closest prior art in the November 2005 Declaration. Specifically, I am aware that the Examiner believes the closest prior art is the embodiment of Roth (US 5,889,084) that teaches an ink composed of a colorant, epoxidized soybean oil and a photoinitiator, without the presence of a vinyl ether monomer. In order to address the Examiner's concerns, I have performed additional tests to compare the ink of the claimed invention with the above-described embodiment of Roth. These tests were performed by either myself or under my direct supervision and control.

3. As a starting point, Comparative Ink 2 was prepared in accordance with Example 1 in col. 12 of Roth. As shown in the Table appearing in col. 13 of Roth, Comparative Ink 2 was composed of a colorant (bromocresol purple), an initiator (SarCat CD 1012), a polymerizable compound (triethylene glycol divinyl ether) and an epoxy compound (Cyracure UVR 6105). Comparative Ink 2 did not contain epoxidized fatty acid ester, an epoxidized fatty acid glyceride or an oxetane compound. Comparative Ink 2 does not fall within the scope of the claimed invention. The composition of Comparative Ink 2 is shown in the attached Table A.

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4. To address the Examiner's criticism of the November 2005 Declaration, I prepared Comparative Ink 21 and Comparative Ink 22. Comparative Ink 21 was prepared in the same manner as Comparative Ink 2, except that 58 parts by weight of triethylene glycol divinyl ether was replaced by 58 parts by weight of epoxidized soybean oil. Comparative Ink 22 was prepared in the same manner as Comparative Ink 21, except that no epoxy compound CyraCure UVR 6105 was used to form the inks, only epoxidized soybean oil. The compositions of Comparative Ink 21 and Comparative Ink 22 are shown in the attached Table A. Comparative Ink 22 represents the embodiment of Roth determined by the Examiner to be the closest prior art (ink composed of a colorant, epoxidized soybean oil and a photoinitiator, without the presence of a vinyl ether monomer).

5. Inventive Ink 23 was prepared in the same manner as Comparative Ink 21, except that 40 parts by weight of epoxy compound was replaced by 40 parts by weight of an oxetane compound (7,8-epoxy-2-oxa-5-methylspiro[3,5]-nonane). Inventive Ink 23 is composed of a colorant, epoxidized soybean oil, a photoinitiator and an oxetane compound as shown in the attached Table A. Inventive Ink 23 is representative of the ink of the claimed invention.

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6. The viscosity, storage stability and safety of Comparative Ink 2, Comparative Ink 21, Comparative Ink 22 and Inventive Ink 23 were evaluated in the manner described on pages 23-24 of this application. The evaluation results are shown in the attached Table B.
7. As shown in the attached Table B, Comparative Ink 22 was not curable. Thus, these tests demonstrate that the ink of Roth determined by the Examiner to be the closest prior art was not capable of functioning as a curable ink.
8. In contrast to Comparative Ink 22, Table B demonstrates that Inventive Ink 23 having an oxetane compound is useful as a curable ink, exhibiting a viscosity variation before and after storage of less than 2.0 mPa·s (A rating) and no observable damage to the skin (A rating).

9. Furthermore, Table B demonstrates that replacing the triethylene glycol divinyl ether of Comparative Example 2 with epoxidized soybean oil produced an ink having a viscosity (55 mPa·s) outside the scope of the claimed invention.

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10. It is my belief that the results shown in the attached Table B are surprising because those skilled in the art would not expect that the claimed ink represented by Inventive Ink 23 would be superior to the inks of Comparative Ink 2, Comparative Ink 21 and Comparative Ink 22.

It is declared by undersigned that all statements made herein of undersigned's own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the U.S. Code; and that such willful false statements may jeopardize the validity of this Application or any patent issuing thereon.

Nobumasa Sasa

Dated: This day of , 2006.

Attached: Table A and Table B

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Table A

Ink No.	Oxetane compound	Epoxy compound	Polymerizable compound	Initiator	Colorant	Others
21		Cytecure UVR 6105 (40 parts by weight)	Epoxidized soybean oil Dainic S-300K (58 parts by weight)	SarCat CD 1012 (1.5 parts by weight)	Bromocresol Purple (0.5 parts by weight)	
22			Epoxidized soybean oil Dainic S-300K (98 parts by weight)	SarCat CD 1012 (1.5 parts by weight)	Bromocresol Purple (0.5 parts by weight)	
23	7,8-epoxy-2-oxa-5-methylspiro-[3.5]-nonane (40 parts by weight)		Epoxidized soybean oil Dainic S-300K (58 parts by weight)	SarCat CD 1012 (1.5 parts by weight)	Bromocresol Purple (0.5 parts by weight)	
2		Cytecure UVR 6105 (40 parts by weight)	Triethylene Glycol Di vinyl Ether (58 parts by weight)	SarCat CD 1012 (1.5 parts by weight)	Bromocresol Purple (0.5 parts by weight)	

- 21: Modified Roth Example 1
- 22: Modified Sample 21
- 23: Modified Sample 21
- 2: Roth Example 1

BEST AVAILABLE COPY**Table B**

Ink No.	Viscosity mPa·s (23 °C)	Ink Storage Stability	Safety	Remarks
21	55	C	C	
22	10	-	-	Not curable
23	45	A	A	Invention
2	35	C	C	Roth